

Contribution of the
Future Earth MENA Regional Center (FEMRC - Cyprus)
&
FE Regional Office (FENARO - Egypt)
to the
Sixth Global Biodiversity Summit of Local and Subnational Governments
at the
14th Meeting of the Parties of the Convention on Biological Diversity (CBD-COP14) 2018

Preface

Following the UN's World Urbanization Prospect Report of 2014, 54% of the world's population now lives in metropolitan areas. By 2050, this percentage will increase to 86% in advanced countries, and 64% in developing nations. It is obvious that this trend poses significant challenges to the sustainability goals as proposed by various international organizations and initiatives such as the UN Sustainable Development Solutions Network or Future Earth (FE).

Already now, the MENA region has a high degree of urbanization. The 30 largest cities in the Arab world with populations of more than one million account for 122 million inhabitants. The region saw a 400% growth in urban structures during 1970 to 2010. It is expected that over the next 40 years there will be an additional 200% growth of larger cities. Thus, the aforementioned sustainability challenges are of particular relevance to the MENA regions and its larger urban structures, including the city of Nicosia, Cyprus.

Climate change will have particularly strong manifestations in urban settings and Mega-cities (e.g., Lelieveld et al., 2014). This is at least partly due to the "urban heat island effect". It is expected that the lowest temperatures in June, July and August in the near future will be higher than the current hottest temperatures during the summer months. This will result in various impacts, including an enhanced scarcity of water resources due to high consumption and diminishing precipitation rates, adding to the aforementioned challenges due to demographic and other developments.

Plenary presentation and Involvement in Round Table Discussion

This presentation will briefly introduce the major challenges faced by large MENA Cities, such as increasing growth of city population, increasing challenges of public and private transport, enhanced intensity and number of heat waves, growing scarcity of water and increased energy needs.

The Future Earth contribution will be shaped primarily to fit into the Focus session 2: *Emerging Trends and Innovations*. In this context, we will focus on the use of solar energy as opposed to biomass cooking fuels, in relevance to the realities of the region. "Solar cooking" will be the central focus, based on the fact that urban and rural cooking in large parts of Africa, in general, and Egypt and the Sinai Peninsula, in particular, is still based on either petroleum or wood/charcoal burning. This has adverse effects on a number of issues including:

- sustainability of forest ecosystems,
 - indoor pollution,
 - local air quality,
 - human health, etc.
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At the Summit, Dr. Manfred Lange, Director of FEMRC will look at the issue of solar cooking in Northern and East Africa from a broader perspective, dealing in particular with sustainability and human health issues in rural and urban conditions. Likewise, Dr. Salah Soliman, Director of FENARO will be talking about the need to replace biomass cooking fuels in urban and rural settings of Egypt and the Sinai Peninsula by solar cookers. His talk will provide information on the practical aspects of such replacements and the multitude of advantages to be gained.

Parallel to this, FE will support its contribution with a fact-based scientific "live" section, which entails a demonstration of the use of solar cookers to prepare meals both for urban and rural households as well as for urban settings, e.g., street vendors or the like.

This presentation will showcase an innovative technical device, the *Fornelia* portable solar oven which was presented at the "2017 Seoul Biennale of Architecture and Urbanism" in a project by FE collaborator, Melina Nicolaidis, Dir. of ACTIVATE nonprofit organization (<http://activate.zone/emmena-project-in-seoul-biennale>), as a gesture of knowledge exchange with South Korea. The oven, which will be used to cook simple meals on the spot, has been designed and built by Savvas Hadjixenophontos, an electronics engineer and inventor from Cyprus. At this Biennale, attended by over 400,000 people, FEMRC participated with several projects which addressed the question of how the urban zones of the Eastern Mediterranean and MENA area will face the pressures of diminishing natural resources and of growing environmental challenges.

Using Solar Energy for Street Cooking

Savvas participated in the Biennale with an ongoing public demonstration of his *Fornelia* portable solar oven (<http://fornelia.com/>). His invention is an affordable renewable energy solution that can cook anything including meat, vegetables, even bread, through a process that is a healthier cooking method than traditional ovens, wood burning etc.

His participation at the COP14 will provide an interesting illustration of how using solar cookers instead of wood or petroleum fired ovens provides a most effective, highly environmentally desirable, and economical way of producing "fast and healthy food" in cities of the MENA area, a region of the world where it can be used year-round.

This portable oven is a very effective and eye-catching tool with which to interact with the Summit participants, the general public of the CBD-COP14, and the policy-making sectors of the countries of the MENA region.



Biennale Director Prof. Hyungmin Pai presents the Solar Cookers to the Korean Press

Please note that we do not aim to promote a product, but an idea that could bring a change to a daily habit and have far reaching effects on many levels regionally and beyond.



Some basic technical information on the Fornelia Solar Oven

The objective of this high-efficiency solar oven is to harness solar energy for the daily cooking of food, which it can be used by over 80 % of the world's population, and year-round in the MENA region.

There is a vast array of solar ovens in terms of types and models, but most of them have very low efficiency and therefore need a lot of time to cook a meal. Furthermore, they have limited space capacity and not enough to satisfy the needs of a family. The materials used for these ovens are usually of low quality, making solar ovens

unusable even after a few uses and in some cases, continued use can prove unhealthy in sanitary terms. Their efficiency, in terms of heat-absorption and heat-conservation can also be non-optimum, they can be heavy, lack mobility in terms of rotation, expensive, difficult to assemble or be made in such a way that replacement parts are unaffordable in terms of been economically pointless.

The Fornelia solar oven creates enough power to cook at the same ratio as common gas, or electric ovens. A number of very carefully designed elements of Fornelia ovens make them the most efficient solution that exists on the market for boiling water, and the results are even better when cooking food.



The inner space of 12+ liters allows cooking large quantities of food for up to 20 people at the same time. The mirrors, mounted on a special flange from aluminum attached on PPS flanges rotate around the cylinder.

Another important element of Fornelia is the completely safe to use. The inside of the aluminum cylinder has a temperature beyond 300 degrees, yet one can touch the outside of glass without any risk of scalding and place their hand in front of the focal without risk, while the temperatures used cannot cause fire ignition by accident.

Conclusion

Through a demonstration at the COP14, we hope to share this knowledge and illustrate the many benefits of such an alternative way of cooking which include: avoidance of fossil fuel consumption, enhanced air quality by avoiding exhaust from fuel burning, a more sustainable use of natural resources and reduced risks to human health, to name but a few. Moreover, this solar-powered oven is particularly relevant for daily cooking to desert-dwelling peoples, such as the Bedouin population of the South Sinai, Egypt.





Images from the “2017 Seoul Biennale of Architecture and Urbanism” in which both the Future Earth MENA Regional Center and Savvas Hadjixenophontos contributed with projects that addressed MENA regional issues and ongoing challenges.

